SSP v1.6.0

Additional Usage Note

Renesas Synergy™ Platform
Synergy Software
Synergy Software Package

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Renesas Synergy™ Platform

SSP v1.6.0 Additional Usage Note

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1. Introduction

This document describes additional usage notes for Synergy Software Package (SSP) version 1.6.0.

2. Release Information

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The intended audience for this release is Renesas Synergy™ customers, prospective customers, partners, and support staff. This document lists additional information on SSP v1.6.0 usage. See the SSP v1.6.0 Release Note for enhancements, bug fixes, and known issues that were identified since the last release for SSP v1.5.2.

3. SSP v1.6.0 Additional Usage Note

3.1 BSP for SSP Supported Platforms

**Issue ID**: 2625

Unaligned access across the memory map boundary 0x20000000 (between SRAMHS and SRAM0) results in a data read/write failure due to the Synergy hardware restriction. However, user applications might cause an unaligned access across the boundary, since linker script files for S7 or S5 MCU parts define the single ‘RAM’ section across SRAMHS and SRAM0. For details on this hardware restriction, see the Arm® Cortex®-M4 Technical Reference Manual, section 3.4.3


**Applies to**: S7 and S5 MCU Series

**Workaround**: Users need to modify their linker script manually to ensure that objects do not cross the memory map boundary, 0x20000000.

**Issue ID**: 10664

If a user is using the trace buffer for debugging and has data stored in the RAM at addresses above 0x20004000, that data is overwritten by the trace buffer when debugging.

**Applies to**: S128 and S1JA MCU Groups

**Workaround**: The S128 linker script currently allocates 1K for the trace buffer at 0x20000000. This allocation could be removed, freeing up the 1K incorrectly reserved for the trace buffer. Using e2 studio, the trace buffer function will store 1K of the trace buffer data beginning at 0x20004000. Therefore, 1K of RAM must not be used by the application if the Trace buffer is to be used for debugging.

3.2 Crypto/r_sce

**Issue ID**: 11147

Only data input lengths that are multiples of the AES block size are supported for AES encryption/decryption APIs for XTS chaining mode.

**Applies to**: S7, S5, and S3 MCU Series

**Workaround**: None
3.3 ISDE User Experience Improvement

**Issue ID:** 12908

A multiple symbol definition error may occur during linkage if an X-Ware library component and the corresponding source component such as ux and ux_src are included. If this occurs, remove the library such as libux.a from the list of libraries used by the linker.

For GCC, this is in the Cross ARM C Linker > Libraries section of the C/C++ Build > Settings in the project Properties.

For IAR, this is in the IAR Linker for ARM > Library section of the C/C++ Build > Settings in the project Properties.

Module Names: ux (USBX), tx (ThreadX), nx (NetX), nxd (NetX Duo), fx (FileX), gx (GUIX), ux_host_class_XXX (USBX Host Classes), ux_device_class_XXX (USBX Device Classes).

**Applies to:** All supported Synergy MCU Groups

3.4 LevelX Records

**Issue ID:** 14455

Build warnings are observed when compiling lx_nand_src with GCC 7.2.1.

**Applies to:** S3, S5, and S7 MCU Series

**Workaround:** None

3.5 MCU Implementation/ SW Architecture

**Issue ID:** 10864

The pin configuration tab in the configurator cannot be used to configure the opamp or analog comparators for every use case.

**Applies to:** S7G2, S5D9, S5D5, S5D3, S3A7, S3A3, S128, and S124 MCU Groups

**Workaround:** Configure the pins manually in the user-defined code.

3.6 NetX

**Issue ID:** 7745

The NetX/NetX Duo FTP Client requires FileX in Stack configuration. Due to dependencies, FileX cannot be removed from the configurator while using the FTP_Client application.

**Applies to:** S7G2, S5D9, and S5D5 MCU Groups

**Workaround:** None

**Issue ID:** 11994

The NetX/Duo FTP server does not support passive data transfer mode. Hence, only active mode FTP can be currently used.

**Applies to:** S7, S5 and S3 MCU series

**Workaround:** None

**Issue ID:** 14215

If a device receives ping packets larger than the available packet pool, the device will be unable to send or receive packets using that packet pool with fragmentation enabled.

**Applies to:** S7G2, S5D9, S5D5, and S5D3 MCUs

**Workaround:** Users should ensure that they allocate sufficiently large packet pool memory.
Issue ID: 14293
Warnings will be observed on compiling nxd applications with GCC7.
**Applies to:** S7, S5 and S3 Series MCUs
**Workaround:** None

### 3.7 nxd_tls_secure

**Issue ID:** 14291
Warnings will be observed on compiling nxd applications with GCC7.x.
**Applies to:** S7, S5 and S3 Series MCUs
**Workaround:** None

### 3.8 r_ctsu

**Issue ID:** 6927

R_CTSU_Update_Parameters() returns error. Not all return codes are described in the function header. Some return codes are as follows:

- SSP_ERR_NOT_OPEN when mode is set to CTSU_MODE_UNCONFIGURED
- SSP_ERR_IN_USE, when the Measurement Status Counter is set to non-zero value, or the CTSU Data Transfer Status flag is set
- SSP_ERR_CTSU_RC_OVERFLOW, when CTSUROVF flag is set
- SSP_ERR_CTSU_SC_OVERFLOW, when CTSSOVF flag is set
- SSP_ERR_CTSU_ICOMP, when TSCAP Voltage Error Monitor flag is set

**Applies to:** All applicable Synergy MCU Groups
**Workaround:** In cases where the returned error code is not described in the function header, see the return code description in the ssp_common_api.h file.

**Issue ID:** 6928

If the customer calls R_CTSU_Read while the driver is in an uninitialized state, then the documented return code is SSP_SUCCESS, but the actual return code is SSP_ERR_NOT_OPEN. When calling R_CTSU_Read while the driver is uninitialized, the application should expect a return code of SSP_ERR_NOT_OPEN.

The R_CTSU_Read() function is not sufficiently tested with the CTSU_READ_FILTERED_REF_ICO_VALUES_SEL and CTSU_READ_FILTERED_REF_ICO_VALUES_ALL options.

**Applies to:** All applicable MCU Groups
**Workaround:** None

**Issue ID:** 6929

Auto-calibration, auto-scan, and auto-drift compensation features are not available in the r_ctsu driver.

**Applies to:** All applicable MCU Groups
**Workaround:** None

**Issue ID:** 6931

Parameter checking for NULL parameters is not implemented. Passing in a NULL parameter to the r_ctsu API will result in undefined system operation.

**Applies to:** S7G2, S5D9, S5D5, S3A7, S128, and S124 MCU Groups
**Workaround:** When using this driver, make sure that the control structure passed to the r_ctsu API is not NULL.
3.9 r_dac8

Issue ID: 14531

Though the end user can add the DAC8 module for the S3A6 MCU using the Synergy Configurator, the open API for the DAC8 module fails as the DAC8 is not supported in SSP for the S3A6 MCU Group.

Applies to: S3A6 MCU Group

Workaround: None

3.10 r_lpmv2

Issue ID: 8548

On exit from Deep Software Standby mode, if the setting to maintain or reset the IO port states is set to maintain the IO port states, the user has to clear the IOKEEP bit to set the IO port states back to their original value after the exit from Deep Software Standby mode.

Applies to: R_LPMV2 Deep Software Standby mode configuration for S5D9, S7G2

Workaround:

The application needs to clear the IOKEEP bit after exiting from Deep Software Standby mode.

Add the following code to the project at entry to main or entry to the first thread to execute:

```c
R_BSP_RegisterProtectDisable(BSP_REG_PROTECT_OM_LPC_BATT);
R_SYSTEM->DSPBYCR_b.IOKEEP = 0;
R_BSP_RegisterProtectEnable(BSP_REG_PROTECT_OM_LPC_BATT);
```

3.11 r_qspi

Issue ID: 9809

QSPI operations should be performed with valid address range. Invalid address operations will not result in warning or error.

Applies to: All MCUs

Workaround: Check for the valid address range before calling QSPI APIs.

3.12 sf_adc_periodic

Issue ID: 14449

NULL parameter checking is done after accessing the value from the pointer in adc_periodic callback.

Applies to: All MCUs

Workaround: The user should not pass NULL as a parameter to the callback function.

3.13 sf_audio_playback_hw_dac

Issue ID: 9308

sf_audio_playback is not tested with the DMAC module as a transfer driver.

Applies to: All boards except S1JA, S128, and S124 boards

Workaround: sf_audio_playback module can use DTC module as a transfer driver, instead of DMAC.

3.14 sf_ble

Issue ID: 9256

The projects using RL78G1D framework will see compilation warnings. All the warnings are in the 3rd party RL78G1D driver code and will not have impact to user applications. The RL78G1D framework file does not have any warnings.

Applies to: RL78G1D on all Synergy MCUs

Workaround: None
3.15 sf_cellular  
**Issue ID:** 9475  
Applications using the cellular framework will not be able to upgrade module firmware over the air (FOTA) since FOTA is not supported by the cellular framework.  
**Applies to:** Cellular framework CAT3 and CAT1 implementation on all Synergy MCUs  
**Workaround:** None

3.16 sf_ble  
**Issue ID:** 9225  
HID profile client mode is not supported by RL78G1D. As a result, the BLE framework implementation of the HID profile also does not support the HID profile client mode. Applications using the BLE framework for RL78G1D will not be able to use the HID profile in client mode.  
**Applies to:** All Synergy MCUs  
**Workaround:** None

3.17 sf_el_fx  
**Issue ID:** 12753  
The warning "control reaches end of non-void function" will be seen if code is configured to reach fxl_fault_tolerant_transaction_fail().  
**Applies to:** S7, S5, and S3 MCU Series  
**Workaround:** None

3.18 sf_el_lx_nor  
**Issue ID:** 12613  
Build warnings are observed when compiling sf_el_lx_nor with GCC.  
**Applies to:** S3, S5, and S7 MCU Series  
**Workaround:** None

3.19 sf_el_nx  
**Issue ID:** 7513  
The current sf_el_nx (NetX Port driver) is hard-coded to use the RMII interface which is for a Micrel Ethernet PHY chip mounted on Renesas kits but does not support other PHY chips or MII interfaces. The customer defines an Ethernet PHY chip driver when using a different PHY chip than the one mounted on Renesas kits, or when using a PHY chip with a MII interface.  
**Workaround:** There is no plan to provide support for additional Ethernet PHY chip drivers included in SSP; users are required to create their own PHY chip driver.  
To create a PHY chip driver, users can use the sf_el_nx (NetX Port) module under `/ssp/src/framework/sf_el_nx/` as a template and modify it for the target Ethernet PHY chip. Source files under sf_el_nx are in plain text; you can copy the file to other directories, such as `/src/` directory, and exclude the original sf_el_nx module from being built to avoid 'multiple definition' compile-error.  
The following steps give high-level guidance to work around the issue:  
1. Copy the directory `/ssp/src/framework/sf_el_nx/` including all the files under the directory to `/src/`.  
2. Exclude original sf_el_nx module in SSP from your build. Right click on the directory `/ssp/src/framework/sf_el_nx/` and select 'Exclude from build...'. Then click the ‘Select All’ button.  
3. Modify `/src/sf_el_nx/nx_hw_init.c`. Modify nx_synergy_ethernet_init() as indicated below to select the MII interface. Change iOPORT ETHERNET MODE RMII to `IOPORT ETHERNET MODE MII`.  
g_ioport_on_iport.pinEthernetModeCfg(iOPORT ETHERNET CHANNEL_n,  
iOPORT ETHERNET MODE MII);
4. Modify `/src/sf_el_nx/phy/ether_phy.c` and `ether_phy.h`. Modify these files to match to your Ethernet PHY chip.

5. Be sure to select MII pins under the ‘Pins’ tab in the Synergy Configurator. Check the pin configuration setting, `Peripherals > Connectivity:ETHERC`.

Notes:
1. Source files under `/ssp/src/framework/sf_el_nx/` are overwritten by the tool when building a project. Be sure to copy the files before editing.
2. To exclude files from building, right-click on the files and select 'Exclude from build' (as is the case for e^{studio}).

3.20 sf_el_ux

**Issue ID**: 8574

The current sf_el_ux HCD driver does not enable the Double Buffer feature for Bulk OUT PIPEs, which is supported by the USB hardware. Therefore, USB data throughput for Data Write through a Bulk OUT PIPE will be less than the value for Double Buffer-Enabled. This issue is only for Data Write (Bulk OUT). Double buffering is supported for Data Read (Bulk IN).

**Applies to**: S7, S5, and S3 MCU Series

**Workaround**: None

3.21 sf_jpeg_decode

**Issue ID**: 14224

If NULL pointer parameter (`p_status`) is passed to wait API, this causes undefined behavior.

**Applies to**: S7G2, S5D9 MCU Groups

**Workaround**: Ensure that the NULL pointer is not passed as an argument (`p_status`) to wait API.

3.22 sf_touch_ctsu

**Issue ID**: 6858

When channel is set to NULL, the SF_TOUCH_CTSU_Read() returns SSP_ERR_INTERNAL.

Return values from the ThreadX API calls are not checked in the framework, which can lead to functional issues in the framework when ThreadX APIs return errors. The framework may not work as expected in such cases, since errors are not handled.

With valid callback and context, if callback_index is set to SF_TOUCH_CTSU_CFG_MAX_WIDGET_TYPES (= 3), SF_TOUCH_CTSU_Open() returns SSP_ERR_OUT_OF_MEMORY.

**Applies to**: All MCUs

**Workaround**: None

**Issue ID**: 6859

SF_TOUCH_CTSU_Read() returns the error value SSP_ERR_INTERNAL if the semaphore get or put is not successful.

**Applies to**: All MCUs

**Workaround**: None
3.23 sf_touch_ctsu_button

Issue ID: 6882
1. Valid range for button_count is 0 to less than
   SF_TOUCH_CTSU_BUTTON_CFG_USER_SUPPORTED_BUTTONS (= 12).
2. For button_count values outside the range, SF_TOUCH_CTSU_Button_Open() returns error
   SSP_ERR_ASSERTION.

Applies to: All MCUs

Workaround: None

Issue ID: 6883

For button_count values outside the range, SF_TOUCH_CTSU_Button_Open() returns the error
SSP_ERR_ASSERTION, and buttons outside the range cannot be operated.

Applies to: All MCUs

Workaround: The button_count values must be set to value 0 to less than
SF_TOUCH_CTSU_BUTTON_CFG_USER_SUPPORTED_BUTTONS (= 12).

Issue ID: 9661

SF_TOUCH_CTSU_BUTTON module is not built for the S5D5_proto board. The build configuration needs to
be updated.

Applies to: S5D5_proto board

Workaround: Add S5D5_proto board in the SF_TOUCH_CTSU_BUTTON build XML

Issue ID: 12742

The GT202 module supported by the WiFi Framework is affected by the WPA2 KRACK issue.

Applies to: GT202 module supported by the WiFi Framework

Workaround: None

3.24 sf_WiFi

Issue ID: 14126

WiFi WPS functionality does not work with WPA security.

Applies to: WiFi Framework using GT202

Workaround: None

3.25 SSP XMLs for ISDE

Issue ID: 10695

The configurator does not warn about the limitation on the RSPI bit rate if the bit rate is less than or equal to
30 MHz.

Applies to: All MCUs

Workaround: The RSPI bit rate must be a positive integer that is less than or equal to 30 MHz or PCLK/2,
whichever is the smaller value.
3.26 Synergy Software Configurator

**Issue ID:** 7665

When using the Synergy Software Configurator in e² studio/SSC, if you rename a thread on the Threads tab and generate code, a new `thread_entry.c` file is created with template content, and the old `thread_entry.c` file remains in the project. If you have edited the `thread_entry.c` file, your changes are not moved to the new file. The old file remains in the project. It will not be called; it causes a build error if not removed from the project manually.

**Applies to:** All MCUs

**Workaround:** Manually move any edits (if made) from the old `thread_entry.c` file to the new `thread_entry.c` file, then manually delete the old `thread_entry.c` file from your project.

3.27 USBX

**Issue ID:** 6470

USBX Host Class Prolific (`ux_host_class_prolific`) is currently included in the SSP package as an experimental module but is yet to be tested, so the functionality is not guaranteed.

**Applies to:** All Applicable MCUs

**Workaround:** Not applicable

**Issue ID:** 8505

Users need to set ‘requested_length’ of the USBX Device CDC API `ux_device_class_cdc_acm_read` large enough compared to the expected reception data length. If the length of the reception data from a USB host is larger than the ‘requested_length,’ the API returns UX_SUCCESS but the reception data will not be stored in a user buffer and the actual length is set to ‘0’.

**Applies to:** All Synergy MCU Groups

**Workaround:** Set ‘requested_length’ of the USBX Device CDC API `ux_device_class_cdc_acm_read` large enough compared to the expected reception data length. `ux_device_class_rndis`

**Issue ID:** 8647

The USB throughput for file read/write operation with `ux_host_class_gser` is not consistent and may vary for every measurement time.

**Applies to:** All Applicable Synergy MCU Groups

**Workaround:** None

**Issue ID:** 10027

USBX Device Class HID does not support Interrupt-Out endpoint. The use of Interrupt-Out endpoint is optional in the USB HID specification. It would not often be the case in embedded applications, but Synergy customers may require the feature for their production.

**Applies to:** All MCUs

**Workaround:** Ask Synergy customer support for a custom HID class example that enables Interrupt-In and Interrupt-Out endpoints.

4. Additional Technical Notes

- Additional technical information, including informative papers and articles on SSP and Synergy can be found at Synergy Knowledge Base, [www.renesassynergy.com/knowledgebase](http://www.renesassynergy.com/knowledgebase).
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# 5. Revision History

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